

REMARKS

Claims 4-7 are currently pending in the patent application. The Examiner has again rejected the amended Claim 4 and the claims which depend therefrom under 35 USC 112. Applicants have amended the language of Claim 4 and believe that the rejection is overcome by the amendments.

The Examiner has rejected Claims 4-6 under 35 USC 103 as unpatentable over the teachings of Muramatsu in view of Glaser; and, Claim 7 under 35 USC 103 as being unpatentable over the teachings of Muramatsu and Glaser in view of Yamagishi. For the reasons set forth below, Applicants respectfully assert that all of the pending claims, as amended, are definite and patentable over the cited prior art.

The presently claimed invention comprises a liquid crystal display device comprising: a liquid crystal display panel comprising a pair of glass substrates facing each other, each having electrodes for applying voltage to a liquid crystal material on a facing surface; a circuit board for supplying voltage; and a liquid crystal driver tape carrier package for connecting the electrodes of the glass substrates to the circuit board and mounting a liquid

crystal driver chip, wherein the liquid crystal driver tape carrier package and the circuit board have more than two anchor holes located in a path region of substantial propagation of stress resulting from a difference in coefficients of linear expansion between the glass substrates, with more than two anchor pins, one inserted into each of the anchor holes, whereby the liquid crystal driver tape carrier package is soldered to the circuit board via the anchor pins and is restrained from movement due to said stress (Claim 4, and Claims 5-7 which depend directly or indirectly therefrom).

The Muramatsu patent is directed to a circuit board structure wherein press fittings are used to join the structure (see: Col. 11, line 63-Col. 12, line 2). Muramatsu has pin shaped protuberances, referred to as "fixing sections" 48, which are part of the frame section (also referred to as the "structural member") that holds the light guide. Two fixing sections are press-fitted into holes in the spacing member 60, flexible wiring board 20, and circuit board 10 on one longitudinal side of the structural member and two fixing sections are press-fitted into holes in the flexible wiring board and the circuit board on the other longitudinal side of the structural

member (Col. 11, lines 37-56). Accordingly, the Muramatsu structure is non-planar when assembled, since the spacing member is only disposed along one longitudinal side of the assembly (Col. 11, lines 47-52). Moreover, a conductive member is additionally disposed between the flexible wiring board and the circuit board on the same longitudinal side. The conductive member 30 is connected to the conductive terminal 12, which is located on the same longitudinal side of the assembly on which is found the spacing member (Col. 12, lines 10-12).

Applicants respectfully assert that the Muramatsu structure does not obviate the invention as claimed. Since Muramatsu provides the pin shaped protuberances on opposite sides of the structure, it cannot restrain movement relative to the frame in the plane direction resulting from any difference in coefficients of linear expansion which may be experienced between the structural member and/or the flexible wiring board and/or the circuit board. The fixing sections 48 would prevent the individual layers from separating entirely, but would not restrain translational movement/propagation of stress due to the differences in coefficients of linear expansion. Furthermore, since Muramatsu does not provide a planar assembly, such that the

structure includes both the spacing member 60 and the conductive member 30 along one longitudinal side of the assembly but does not have the same components on the other side of the assembly, the Muramatsu assembly would be prone to additional stresses, since different materials/components are in contact at different locations on the assembly and would experience disproportionate stresses as a result of the different materials. The present invention, in contrast, does provide proper restraint since more than two anchor holes are provided, and are provided in a path region of substantial propagation of stress resulting from the difference in coefficients of linear expansion between the coextensive components (i.e., the liquid crystal display panel and the circuit board). Applicants respectfully assert that the Muramatsu patent does not obviate the invention as claimed since Muramatsu neither teaches nor suggests the claimed structure.

Applicants further aver that the addition of the Glaser patent teachings to the Muramatsu patent teachings would not result in the invention as claimed. Glaser teaches connector pins but does not disclose anchor pins. Moreover, as earlier argued, Glaser discloses the use of non-conductive insulated materials around the connector

pins, which would not permit the claimed soldering. Finally, Glaser neither teaches nor suggests anchor holes that are located in a path region of substantial propagation of stress resulting from a difference in coefficients of linear expansion between two substrates. Absent some teaching or suggestion of the claim features by at least one of the cited references, an obviousness rejection of Claims 4-6 simply cannot be maintained. Accordingly, Applicants respectfully request withdrawal of the rejections.

With regard to the rejection of Claim 7 based on the combination of teachings from Muramatsu and Glaser and further in view of Yamagishi, Applicants rely on the arguments presented above with respect to the non-obviousness of the claimed invention over the combined teachings of Muramatsu and Glaser. Applicants further assert that the Yamagishi patent does not provide the teachings which are missing from the combination of Muramatsu and Glaser, since Yamagishi neither teaches nor suggests anchor holes that are located in a path region of substantial propagation of stress resulting from a difference in coefficients of linear expansion between the glass substrates, with anchor pins inserted into the anchor holes. Moreover, Yamagishi teaches that through vias be

disposed along a direction parallel to the longitudinal direction of the printed circuit board (see: Col. 3, lines 53-67), which teachings are consistent with Muramatsu and contrary to the present claim language. The Yamagishi use of a ground plane does not, alone or in combination with the Muramatsu and Glaser patent teachings, obviate the invention as recited in Claim 7. Accordingly, Applicants respectfully request withdrawal of the rejection of Claim 7.

Based on the foregoing amendments and remarks, Applicants respectfully request entry of the amendments, reconsideration of the amended claim language in light of the remarks, withdrawal of the rejections, and allowance of the claims.

Respectfully submitted,
Y. Natsuyama, et al

By:


Anne Vachon Dougherty
Registration No. 30,374
Tel. (914) 962-5910